

Bayesian methods for updating mathematical models for instrumented structures

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It has become feasible in recent years to instrument civil engineering structures to measure their performance under operational conditions. These measured responses provide an opportunity to examine and update mathematical models for structural behavior. The resulting problems constitute inverse problems with attendant challenges in dealing with over determined set of equations, important influence of imperfections in measurements and mathematical models, and structural nonlinearities. The talk addresses problems of identification of parameters of postulated finite element models for the structures, and also questions on updating of response sensitivity and reliability models. The study is based on the application of Bayesian filtering methods for this type of problems. Application of the tools developed to problems of condition assessment of existing railway bridges in south India is also discussed.

Brief Bio: C S Manohar holds a PhD degree in Structural Engineering from the Indian Institute of Science. His research interests are focused on structural reliability modeling, structural system identification, and structural dynamics & earthquake engineering. He serves on the editorial boards of Structural safety, Probabilistic Engineering Mechanics, Structural Control and Health Monitoring, and Earthquake and Structures.